

CLAIMS

1. A laser beam machine having laser beam radiating means for radiating laser beam on a workpiece, said laser beam radiating means having an opening for said laser beam and an annular electrode facing said workpiece provided at an outer periphery of said opening, said laser beam machine further having gap length control means for controlling gap length between said laser beam radiating means and said workpiece on the basis of capacitance generating between said annular electrode and said workpiece, comprising:

said laser beam radiating means having a center electrode at an inner periphery of said annular electrode; and

center electrode potential control means for controlling potential of said center electrode so as to keep zero (0) or a positive constant voltage.

2. The laser beam machine according to claim 1, wherein the center electrode has a workpiece facing surface concentrically formed with said opening for said laser beam as its center.

3. The laser beam machine according to claim 1, wherein said laser beam radiating means has a first

guard annular electrode which intervenes between said center electrode and said annular electrode, an impedance converting means is provided, having an input portion input impedance of which is infinity (∞) for connecting with said annular electrode and an output portion output impedance of which is zero (0) for connecting with said first guard annular electrode, and high frequency voltage supply means for supplying said annular electrode with high frequency voltage is provided.

4. The laser beam machine according to claim 3, wherein said laser beam radiating means has a second guard annular electrode which is connected with said output portion of said impedance converting means at an outer periphery of said annular electrode.

5. A laser beam machine having laser beam radiating portion for radiating laser beam on a workpiece, said laser beam radiating portion having an opening for said laser beam and an annular electrode facing said workpiece provided at an outer periphery of said opening, said laser beam machine further having gap length control unit for controlling gap length between said laser beam radiating portion and said workpiece on the basis of capacitance generating between said annular electrode and said

workpiece, comprising:

said laser beam radiating portion having a center electrode at an inner periphery of said annular electrode; and

center electrode potential control unit for controlling potential of said center electrode so as to keep zero (0) or a positive constant voltage.

6. The laser beam machine according to claim 5, wherein the center electrode has a workpiece facing surface concentrically formed with said opening for said laser beam as its center.

7. The laser beam machine according to claim 5, wherein said laser beam radiating portion has a first guard annular electrode which intervenes between said center electrode and said annular electrode, an impedance converting unit is provided, having an input portion input impedance of which is infinity (∞) for connecting with said annular electrode and an output portion output impedance of which is zero (0) for connecting with said first guard annular electrode, and high frequency voltage supply unit for supplying said annular electrode with high frequency voltage is provided.

8. The laser beam machine according to claim 7,

wherein said laser beam radiating portion has a second guard annular electrode which is connected with said output portion of said impedance converting unit at an outer periphery of said annular electrode.